CLAIMS

1. A search engine system, comprising:

a memory bank coupled to a bank selection signal;

a plurality of mask logic blocks, wherein each mask logic block is configured to receive a constructed key and an incoming key mask and to provide a masked key;

a plurality of hash function blocks, wherein each hash function block is configured to receive at least two of the masked keys and to provide at least three hash function outputs; and

a multiplexer configured to receive a plurality of hash function outputs and to provide the bank selection signal.

2. The search engine system of claim 1, wherein:

the memory bank includes memory that is substantially static random access memory (SRAM) type.

3. The search engine system of claim 1, wherein:

the memory bank is arranged as a plurality of buckets, wherein each bucket includes a plurality of entries.

4. The search engine system of claim 3, wherein:

the bank selection signal is configured to select one of the plurality of buckets.

5. The search engine system of claim 3, wherein:

each of the plurality of entries includes a stored key pattern field, a local mask field, and a hash function indication field.

6. The search engine system of claim 1, wherein:

the constructed key includes information from a packet header.

7. The search engine system of claim 1, wherein:

each of the plurality of mask logic blocks includes a logical-AND type function.

8. The search engine system of claim 1, wherein:

each of the plurality of hash function blocks includes:

a first hash function generator configured to receive a first masked key and to provide a first hash function output;

a second hash function generator configured to receive a second masked key and to provide a second hash function output; and

a third hash function generator configured to receive the first masked key and the second masked key and to provide a third hash function output.

9. The search engine system of claim 8, wherein:

the third hash function output is configured for a concatenated key type search.

10. The search engine system of claim 8, wherein:

each of the first, second, and third hash function generators includes a Cyclic Redundancy Code (CRC) type function.

11. The search engine system of claim 1, wherein:

the multiplexer is configured to receive at least eight hash function outputs.

12. The search engine system of claim 11, wherein:

the at least eight hash function outputs includes outputs from at least four different hash function blocks.

13. The search engine system of claim 9, wherein:

the concatenated key type search includes a same address selection in a first memory bank and a second memory bank.

14. The search engine system of claim 5, further comprising:

a comparator configured to provide a match indication for each of the plurality of entries in response to a comparison between the constructed key and the stored key pattern.

15. The search engine system of claim 14, wherein:

the comparator includes an AND-function block configured to provide a masking of the constructed key by applying the local mask field.

16. The search engine system of claim 12, wherein:

the multiplexer is configured to select a different one of the outputs from the at least four different hash function blocks in response to a clock signal.

17. The search engine system of claim 3, wherein:

in a first mode, each of the plurality of entries is configured to be responsive to any of the plurality of hash function outputs; and

in a second mode, each of the plurality of entries is configured to be responsive to a designated one of the plurality of hash function outputs.

18. A method of searching a table, comprising the steps of:

constructing a plurality of keys;

performing a key masking on each of the plurality of keys to provide a plurality of masked keys;

performing a hashing on each of the plurality of masked keys;

determining if a system is in a shared mode;

if the system is in the shared mode, sharing a plurality of hash functions for an entry of a memory bank;

if the system is not in the shared mode, hard configuring the hash functions for the entry of the memory bank;

selecting a bucket from the memory bank;

applying a local mask;

performing a comparison to provide one or more match indications; and

determining a precedence from among the one or more match indications.

19. The method of searching the table of claim 18, wherein:

the constructing the plurality of keys includes getting information from a packet.

20. The method of searching the table of claim 18, wherein:

the performing the hashing includes using a Cyclic Redundancy Code (CRC) type function.

21. A means for searching a table, comprising:

a means for constructing a plurality of keys;

a means for performing a key masking on each of the plurality of keys to provide a plurality of masked keys;

a means for performing a hashing on each of the plurality of masked keys;

a means for determining if a system is in a shared mode;

if the system is in the shared mode, a means for sharing a plurality of hash functions for an entry of a memory bank;

if the system is not in the shared mode, a means for hard configuring the hash functions for the entry of the memory bank;

a means for selecting a bucket from the memory bank;

a means for applying a local mask;

a means for performing a comparison to provide one or more match indications; and

a means for determining a precedence from among the one or more match indications.